

; *****

; O T O R

; *****

; Stacktiefe < 30H

CTC:	EQU	00H
PRUEB:	EQU	04H
ASS:	EQU	20H
PDISP:	EQU	ASS+1
SCHALT:	EQU	ASS+3
KONSOL:	EQU	ASS+3
TASTER:	EQU	ASS+7
PREG:	EQU	ASS+8
PDRUMS:	EQU	ASS+18H
MSTAT:	EQU	ASS+1AH
OKT:	EQU	40H
MOD:	EQU	60H
DEC:	EQU	80H
AMP:	EQU	0A0H
AFTG:	EQU	0E0H
K1:	EQU	48077
RAM:	EQU	1000H
RAMLEN:	EQU	3FFH
NOSZ:	EQU	8
NHPN:	EQU	2
NHPM:	EQU	4
NHP:	EQU	NHPN*NHPM
NTPN:	EQU	2
NTPM:	EQU	4
NTP:	EQU	NTPN*NTPM
NFPN:	EQU	2
NFPM:	EQU	4
NFP:	EQU	NFPN*NFPM
NGP:	EQU	4
NREGGR:	EQU	16
FKLEN:	EQU	NREGGR+1+NHP+NTP+NFP+NGP

; *****

ORG 0000H

OTOR: JP TLED
DEFM 'OTOR : '
DEFM 'WRITTEN BY HELMUT METZ'

TICTC: DEFW 0
DEFW TCTC1
DEFW TCTC2
DEFW 0

ICTC: DEFW ZYKL01
DEFW ZYKL02

TCTC3: DEFW TCTC0
TCTC4: DEFW TKART

TCTC5: DEFB 20H
DEFB 37H
DEFB 255
DEFB 0C7H
DEFB 10
DEFB 0C7H
DEFB 40

ICTC1: DEFB 28H
DEFB 87H
DEFB 156
DEFB 0A7H
DEFB 195

;*****

;***** D I A G N O S E *****

;*****

;***** UP ZEIT *****

```
ZEIT:  LD      HL,K1
       DEC     HL
ZEIT1: DEC     HL
       LD      A,H
       OR      L
       JR      NZ,ZEIT1
       JP      (IX)
```

;***** TEST LED *****

```
TLED:  LD      C,PRUEB      ; "0
       IN      D,(C)
       BIT     0,D          ; S1_0
       JP      Z,SYSTEM
```

```
       LD      B,1
TLED1: OUT     (C),B
       INC     B
       LD      IX,TLED2
       JP      ZEIT
TLED2: IN      A,(C)
       BIT     0,A          ; S1_0
       JR      NZ,TLED1
```

;***** TEST RAM *****

```
TRAM:  LD      B,1          ; "1
       OUT     (C),B
       LD      IX,TRAM3
       JP      ZEIT
```

```
TRAM3: LD      HL,RAM
       LD      DE,RAM+1
       LD      A,55H
       LD      (HL),A
       LD      BC,RAMLEN-1
```

```
TRAM0: LDI
       JP      PO,TS1
       CP      (HL)
       JR      Z,TRAM0
       LD      B,1
       LD      A,(HL)
       AND     0FH
       CP      5
       JR      Z,TRAM1
       SET     2,B
```

```
TRAM1: LD      A,(HL)
       AND     0F0H
       CP      50H
       JR      Z,TRAM2
       SET     3,B
```

```
TRAM2: LD      C,PRUEB
       OUT     (C),B
       HALT
```


;***** TEST SCHALTER S1_1 - S1_3 *****;

```
TS1: LD B,2 ; "2 3 8 0 0 0 A 1 0 *****
OUT (C),B
IN A,(C) *****
LD D,A *****
CPL *****
AND 0EH *****
LD E,A *****
TS1_0: IN A,(C) *****
CP D *****
JR Z,TS1_0 *****
LD D,A *****
LD B,9 *****
OUT (C),B *****
LD IX,TS1_1 *****
JP ZEIT *****
TS1_1: LD B,1 *****
OUT (C),B *****
LD A,D *****
AND 0EH *****
CP E *****
JR NZ,TS1_0 *****
```

;***** TEST CTC *****

```
TCTC: LD B,3 ; "3
OUT (C),B
LD A,0
LD I,A
IM 2

LD HL,TCTC5
LD C,CTC
LD B,3
OTIR
INC C
LD B,2
OTIR
INC C
LD B,2
OTIR

LD C,PRUEB
LD B,2
TCTC0: EI
JR TCTC0

TCTC1: DI
LD A,B
XOR B
LD B,A
OUT (C),B
LD HL,TCTC3
LD SP,HL
RETI

TCTC2: DI
LD HL,TCTC4
LD SP,HL
RETI
```


;***** TEST KARTEN *****

```
TKART:  LD      HL, RAM+RAMLEN
        LD      SP, HL
TKAR0:  LD      B, 3
        LD      C, ASS
        CALL    TKAR1          ; "4
        LD      C, OKT
        CALL    TKAR1          ; "5
        LD      C, DEC
        CALL    TKAR1          ; "6
        LD      C, AMP
        CALL    TKAR1          ; "7
        JR      TKAR0
```

```
TKAR1:  IN      A, (PRUEB)
        BIT     0, A
        JR      Z, TKAR1
        INC     B
        LD      A, B
        OUT     (PRUEB), A
TKAR2:  LD      A, 'T'
        OUT     (C), A
        LD      IX, TKAR3
        JP      ZEIT
TKAR3:  IN      A, (PRUEB)
        BIT     0, A
        JR      NZ, TKAR2
        RET
```



```
*****
```

```
***** SYSTEM *****
```

```
*****
```

```
***** SYSTEMINITIALISIERUNG *****
```

```
SYSTEM: LD      B,4
          LD      IX,SYST02
SYST01: JP      ZEIT
SYST02: DJNZ     SYST01

          LD      HL, RAM+RAMLEN
          LD      SP, HL
          XOR     A
          LD      I, A
          IM      2
```

```
          LD      HL, ICTC1
          LD      B, 03
          LD      C, CTC
          OTIR
          LD      B, 02
          INC     C
          OTIR
```

```
DSTART: LD      HL, TONTAB
          XOR     A
          CALL    TABLOE
          LD      HL, OLDTAB
          CALL    TABLOE
          LD      HL, NEWTAB
          CALL    TABLOE
          LD      HL, AMPTAB
          CALL    TABLOE
          LD      HL, PHATAB
          CALL    TABLOE
          LD      HL, INDTAB
          DEC     A
          CALL    TABLOE
```

```
          LD      HL, 0001H
          LD      (LOELEN), HL
```

```
          LD      IX, CTCTAB
          LD      A, OKT
          LD      C, DEC
          LD      D, AMP+1
          LD      E, MOD
          LD      B, NOSZ
SYST03: LD      (IX+0), A
          LD      (IX+DECTAB-CTCTAB), C
          LD      (IX+ANATAB-CTCTAB), D
          LD      (IX+MODTAB-CTCTAB), E
          ADD     A, 4
          INC     C
          INC     D
          INC     E
          INC     IX
          BIT     0, D
          JR      Z, SYST04
```

```
; AUFBAU
; CTCTAB &
; DECTAB &
; ANATAB &
; MODTAB
```


BIT	1,D
JR	Z,SYST04
INC	D
SYST04: DJNZ	SYST03
LD	A,00H
LD	B,47H
LD	C,AMP
OUT	(C),B
OUT	(C),A
LD	B,NOSZ
LD	C,DEC
SYST05: OUT	(C),A
INC	C
DJNZ	SYST05
XOR	A
LD	(FKOMB),A
LD	(INASTA),A
LD	HL,DPUFF
LD	C,PDISP+1
LD	D,1
EXX	
LD	A,(TASTGR)
RLCA	
RLCA	
RLCA	
RLCA	
LD	B,A
LD	A,(DRUMS)
OR	B
OUT	(PDRUMS),A
CALL	FKHOL

;***** VORDERGRUND *****

```
FCOM:  EI
      LD  HL,TXT1
      CALL WRTXT
FC01:  LD  A,(FKOMB)
      CALL ZIFF
      LD  (DPUFF+6),A
      LD  IX,FCOM

FC02:  CALL INATES
      JR  NC,FC03
      LD  (FKOMB),A
      CALL FKHOL
      JR  FC01

FC03:  CP  16H
      JR  NZ,FC01
      LD  HL,4040H
      LD  (DPUFF+4),HL
      CALL FKH10
      EX  DE,HL
      LD  HL,REGSP
      LD  BC,FKLEN
      LDIR

FC07:  CALL INA
      CP  16H
      JR  Z,FC07
      JR  FCOM
```


; ** UP FKHOL **

; FREIE KOMB. HOLEN

FKHOL: CALL FKH10
LD DE, REGSP
LD BC, FKLEN
LDIR

LD HL, REGSP
LD C, PREG-1
LD B, NREGGR

FKH3: INC
OUTI
JR NZ, FKH3
RET

FKH10: LD A, (FKOMB)
LD C, A
LD HL, FK0
LD B, FKLEN
LD A, L

FKH11: ADD A, C
JR NC, FKH12
INC H

FKH12: DJNZ FKH11
LD L, A
RET

FK00: DEFW 0
DEFW 0
DEFW 0
DEFW 0
DEFW 0FFFFH
DEFW 0FFFFH
DEFW 0FFFFH
DEFW 0FFFFH

*** HUELLKURVENPARAMETER- ***
*** EINGABE ***

HUELLP: LD HL, TXT12
CALL WRTXT
LD HL, HP11
LD (PAREAD), HL
LD A, 'H'
LD (PARECO), A
JP PAREIN

*** TREMOLOPARAMETER ***
*** EINGABE ***

TREMP: LD HL, TXT13
CALL WRTXT
LD HL, TP11
LD (PAREAD), HL
LD A, 'T'
LD (PARECO), A
JP PAREIN

*** FILTERPARAMETER ***
*** EINGABE ***

FILTP: LD HL, TXT14
CALL WRTXT
LD HL, FP11
LD (PAREAD), HL
LD A, 'F'
LD (PARECO), A
JP PAREIN

*** GENERATORPARAMETER ***
*** EINGABE ***

GENP: LD HL, TXT16
CALL WRTXT
LD HL, GP1
LD (PAREAD), HL
LD A, 'G'
LD (PARECO), A
JP PAREIN

; *** RHYTHMUSEINGABE

; ***

DRUMSE: LD HL, TXT15
 CALL WRTXT
 LD A, (DRUMS)
 LD IY, DPUFF+5
 CALL DBYTE
 LD IX, DRUMSE

DRUMS1: CALL INATES
 CP 0AH
 JR NC, DRUMS1
 LD B, A
 LD IY, DPUFF+5
 CALL ZIFF

OR 80H
 LD (IY+1), A
 XOR A
 LD (IY+0), A
 LD A, B
 CP 2
 JR NC, DRUMS3

DRUMS2: CALL INATES ; 2. ZIFFER
 CP 17H ; ET ?
 JR Z, DRUMS4
 CP 3

JR NC, DRUMS2
 LD C, A
 LD A, (IY+1)
 AND 7FH
 LD (IY+0), A
 LD A, C
 CALL ZIFF
 OR 80H
 LD (IY+1), A
 LD A, B
 LD B, C
 CP 0

JR Z, DRUMS3
 LD A, C
 ADD A, 10
 LD B, A

DRUMS3: CALL ENTER
 DRUMS4: LD HL, DRUMS
 LD (HL), B
 LD A, (TASTGR)
 RLCA
 RLCA
 RLCA
 RLCA
 OR (HL)
 OUT (PDRUMS), A
 JR DRUMSE


```

*** UP PAREIN ***
;PARAMETEREINGABE

```

```

PAREIN: LD      IX,PAREIN
        LD      IY,DPUFF+2
        LD      (IY+0),0
        LD      (IY+1),00H
        LD      (IY+2),0
        LD      (IY+3),0
        LD      (IY+4),0
        LD      A,(PAREC0)
        CP      'G'                      ;GP ?
        LD      A,0
        JR      Z,PARE1
        CALL    INATES                    ;A:=n
        CP      17H                      ;ET ?
        JR      Z,PARE3
        CP      NHPN+1                   ;n>NHPN ?
        JR      NC,PAREIN
        CP      1                        ;n<1 ?
        JR      C,PAREIN
PARE1:  PUSH    AP
        CALL    ZIFF
        LD      IY,DPUFF+2
        LD      (IY+0),A                  ;ANZEIGE n
        POP     AF
        LD      HL,MADR1
        RLD
PARE2:  CALL    INATES                    ;A:=m
        CP      17H                      ;ET ?
        JR      NZ,PARE21
        LD      A,1                      ;m:=1
PARE21: CP      NHPM+1                   ;m>NHPM ?
        JR      NC,PARE2
        CP      1                        ;m<1 ?
        JR      C,PARE2
        PUSH    AF
        CALL    ZIFF
        OR      00H
        LD      (IY+1),A                  ;ANZEIGE m
        POP     AF
        RLD                              ;<MADR1>:=nm
        JR      PARE4
PARE3:  LD      A,11H                    ;nm:=11
        LD      (MADR1),A
        LD      A,(PAREC0)
        CP      'G'                      ;GP ?
        JR      NZ,PARE4
        LD      A,01H                    ;nm:=01 FUER GP
        LD      (MADR1),A
PARE4:  LD      A,(MADR1)                ;A:=nm
        LD      IY,DPUFF+2
        CALL    BYTE                      ;ANZEIGE nm
        AND     0FH
        DEC     A                        ;A=m-1
        LD      HL,(PAREAD)
        ADD     A,L
        LD      L,A
        JR      NC,PARE41
        INC     H

```



```

PARE41: LD      A, (MADR1)
        LD      B, A                      ; B=nm
        BIT     5, B                      ; n=2 ODER 3 ?
        JR      Z, PARE43
        LD      A, NHPM
        BIT     4, B                      ; n=3 ?
        JR      Z, PARE42
        RLCA                               ; 2 x NHPM
PARE42: ADD     A, L
        LD      L, A
        JR      NC, PARE43
        INC     H
PARE43: LD      (MADR2), HL              ; <HL>=<HPnm>
PARE5:  LD      HL, (MADR2)
        LD      A, (HL)                  ; A=<<HPnm>>
        LD      B, 0
        LD      HL, HUPAST
PARE51: CP      (HL)                     ; SUCHE VON <<HPnm>>
        JR      Z, PARE52                 ; IN HUPAST
        JR      C, PARE52
        INC     B
        INC     HL
        JR      PARE51
PARE52: LD      A, B
        LD      IX, DPUFF+5
        CALL    DBYTE                     ; ANZEIGE DER STUFE
        LD      IX, PAREIN                 ; VON <<HPnm>>
PARE6:  CALL    INATES
        JR      C, PARE8
        CP      17H                       ; ZIFFER ?
        JR      NZ, PARE6
        LD      HL, MADR1
        INC     (HL)                       ; nm:=nm+1
        LD      A, (HL)
        AND     0FH
        CP      NHPM+1
        JR      NZ, PARE4
        LD      A, (PARECO)
        CP      'G'                       ; GP ?
        JR      Z, PARE3
        LD      A, (HL)
        AND     0F0H
        ADD     A, 11H                     ; n+1 m+1
        LD      (HL), A
        AND     0F0H
        LD      B, A
        LD      A, NHPM*10H
        CP      B
        JR      NC, PARE4
        LD      A, 11H                     ; nm:=11
        LD      (HL), A
        JR      PARE4
PARE8:  CP      0AH
        JR      NC, PARE6
        LD      IX, PARE5
        LD      B, A
        CALL    ZIFF
        OR      80H

```



```
LD      IY, DPUFF+5
LD      (IY+1), A
XOR     A
LD      (IY+0), A
LD      A, B
CP      2
JR      NC, PAREB3
PAREB1: CALL INATES          ; 2. STELLE
CP      17H                  ; ET ?
JR      Z, PAREB4
CP      0AH
JR      NC, PAREB1
LD      C, A
LD      A, (IY+1)           ; 1. STELLE VERSCHIEBEN
AND     7FH
LD      (IY+0), A
LD      A, C
CALL    ZIFF
OR      80H
LD      (IY+1), A          ; 2. STELLE ANZEIGEN
LD      A, C
SUB     10
INC     B
PAREB2: ADD     A, 10
DJNZ    PAREB2
LD      B, A
PAREB3: CALL    ENTER
PAREB4: LD      HL, HUPAST
LD      A, B
ADD     A, L
LD      L, A
JR      NC, PAREB5
INC     H
PAREB5: LD      A, (HL)
LD      HL, (MADR2)
LD      (HL), A
JP      PARE5

HUPAST: DEFB     00
        DEFB     01
        DEFB     02
        DEFB     03
        DEFB     05
        DEFB     07
        DEFB     0AH
        DEFB     0FH
        DEFB     16H
        DEFB     20H
        DEFB     30H
        DEFB     40H
        DEFB     58H
        DEFB     70H
        DEFB     88H
        DEFB     0A0H
        DEFB     0B8H
        DEFB     0D0H
        DEFB     0E8H
        DEFB     0FFH
```



```
*****
```

```
***** MONITOR *****
```

```
*****
```

```
MONITO: LD      HL,TXT2
        CALL    WRTXT
MON0:   LD      IX,MONITO
        CALL    INATES
```

```
        CP      0DH                ;DISPLAY ?
        JP      NZ,MON20
```

```
;** DISPLAY MEMORY **
```

```
MON10:  LD      HL,TXT3
        CALL    WRTXT
        LD      B,4
        LD      HL,MADR1+1
        LD      IX,MON10
        LD      IY,DPUFF+1
        CALL    ZAHL                ;EINGABE ADRESSE
```

```
MON11:  LD      HL,(MADR1)
        LD      A,(HL)
        LD      IY,DPUFF+5
        CALL    BYTE                ;ANZEIGE INHALT

        CALL    INA
        JR      Z,MON11
        CP      17H                ;ET?
        JR      NZ,MON13
        INC     HL                ;NAECHSTE ADRESSE
        LD      (MADR1),HL
        LD      IY,DPUFF+1
        LD      A,H
        CALL    BYTE
        LD      A,L
        CALL    BYTE
        SET     7,(IY-1)
        JR      MON11
```

```
MON13:  CALL    KOTEST
        JR      NC,MON11
```

```
MON14:  LD      B,2                ;EINGABE DATEN
        LD      HL,MDAT
        LD      IY,DPUFF+5
        LD      (IY+1),80H
        CALL    ZAHLA
```

```
        CALL    ENTER
        LD      A,(MDAT)
        LD      HL,(MADR1)
        LD      (HL),A                ;DATEN SCHREIBEN
        JR      MON11
```

```
MON20:  CP      1
        JR      NZ,MON30
```

```
** INPUT PORT **
```



```

MON21: LD      HL,TXT4
      CALL     WRTXT

      LD      B,2
      ;PORT
      LD      HL,MADR1
      LD      IY,DPUFF+2
      LD      IX,MON21
      CALL     ZAHL

MON22: LD      HL,MADR1
      LD      C,(HL)
      IN      A,(C)
      LD      IY,DPUFF+5
      CALL     BYTE
      ;ANZEIGE
      CALL     INA
      JR      Z,MON22
      CALL     KOTEST
      CP      17H
      ;ET?
      JR      NZ,MON22
      INC     (HL)
      LD      A,(HL)
      LD      IY,DPUFF+2
      CALL     BYTE
      JR      MON22

MON30: CP      0
      ;OUTPUT ?
      JR      NZ,MON40

; ** OUTPUT PORT **

MON31: LD      HL,TXT5
      CALL     WRTXT

      LD      B,2
      ;ADRESSE
      LD      HL,MADR1
      LD      IY,DPUFF+2
      LD      IX,MON31
      CALL     ZAHL

MON32: CALL     INATES
      JR      C,MON33
      CP      17H
      ;ET?
      JR      NZ,MON32
      INC     (HL)
      LD      A,(HL)
      LD      IY,DPUFF+2
      CALL     BYTE
      JR      MON32

MON33: LD      B,2
      LD      HL,MDAT
      LD      IY,DPUFF+5
      LD      (IY+1),80H
      CALL     ZAHLA
      ;DATEN
      CALL     ENTER
      LD      HL,MADR1
      LD      C,(HL)
      LD      A,(MDAT)
      OUT     (C),A
      LD      IY,DPUFF+5
      LD      (IY+0),0

```



```

LD      (IY+1),0
JR      MON32

```

```

MON40:  CP      0FH      ;FILL ?
JR      NZ,MON50

```

```

; ** FILL MEMORY **

```

```

MON41:  LD      HL,TXT6
CALL    WRTXT
LD      B,4
LD      HL,MADR1+1
LD      IX,MON41
LD      IY,DPUFF+3
CALL    ZAHL      ;ANFANGSADRESSE
CALL    ENTER

```

```

MON42:  LD      HL,TXT7
CALL    WRTXT
LD      B,4
LD      HL,MADR2+1
LD      IX,MON42
LD      IY,DPUFF+3
CALL    ZAHL      ;ENDADRESSE
CALL    ENTER

```

```

MON43:  LD      HL,TXT8
CALL    WRTXT
LD      B,2
LD      HL,MDAT
LD      IX,MON43
LD      IY,DPUFF+4
CALL    ZAHL      ;DATEN
CALL    ENTER

```

```

LD      HL,(MADR1)      ;ANFANG
EX      DE,HL
LD      HL,(MADR2)      ;ENDE
XOR     A               ;CY:=0
SBC     HL,DE
LD      B,H
LD      C,L
LD      H,D
LD      L,E
INC     DE
LD      A,(MDAT)
LD      (HL),A
LDIR
JP      MONITO

```

```

MON50:  CP      0BH      ;BEWEGEN ?
JP      NZ,MONITO

```

```

; ** BEWEGEN **

```

```

MON51:  LD      HL,TXT9
CALL    WRTXT
LD      B,4
LD      HL,MADR1+1
LD      IX,MON51
LD      IY,DPUFF+3
CALL    ZAHL      ;ANFANGSADRESSE

```



```

CALL    ENTER
MON52: LD      HL,TXT10
CALL    WRTXT
LD      B,4
LD      HL,MADR2+1
LD      IX,MON52
LD      IY,DPUFF+3
CALL    ZAHN
CALL    ENTER

```

```

MON53: LD      HL,TXT11
CALL    WRTXT
LD      B,4
LD      HL,MADR3+1
LD      IX,MON53
LD      IY,DPUFF+3
CALL    ZAHN
CALL    ENTER

```

```

LD      HL,(MADR1)
EX      DE,HL
LD      HL,(MADR2)
XOR     A
SBC     HL,DE
LD      B,H
LD      C,L
INC     BC
LD      HL,(MADR3)
EX      DE,HL
LDIR
JP      MONITO

```

```

; ** UP WRTXT **

```

```

; HL -TEXTANFANG (7 ZEICHEN)

```

```

WRTXT:  PUSH    BC
        PUSH    DE
        LD      BC,7
        LD      DE,DPUFF
        LDIR
        POP     DE
        POP     BC
        RET

```

```

; ** UP ZIFF **

```

```

; A- ZIFFER-->CODE

```

```

ZIFF:   PUSH    HL
        LD      HL,ZIFFT
        AND     0FH
        ADD     A,L
        LD      L,A
        JR      NC,ZIFF1
        INC     H
ZIFF1:  LD      A,(HL)
        POP     HL
        RET

```

```

ZIFFT:  DEFB    3FH ; 0

```



```

DEFB 06H ; 1
DEFB 5BH ; 2
DEFB 4FH ; 3
DEFB 66H ; 4
DEFB 6DH ; 5
DEFB 7DH ; 6
DEFB 07H ; 7
DEFB 7FH ; 8
DEFB 6FH ; 9
DEFB 77H ; A
DEFB 7CH ; b
DEFB 39H ; C
DEFB 5EH ; d
DEFB 79H ; E
DEFB 71H ; F

```

;** UP BYTE **

```

; 1BYTE HEX --> 2BYTE CODE
; A -BYTE
; IY -DISPLAYANFANG

```

```

BYTE:  PUSH  AF
        PUSH  BC
        LD    C,A
        RLCA
        RLCA
        RLCA
        RLCA

```

```

BYTE1:  CALL  ZIFF
        LD    (IY),A
        INC  IY
        LD    A,C
        CALL ZIFF
        LD    (IY),A
        INC  IY
        POP  BC
        POP  AF
        RET

```

```

DBYTE:  PUSH  AF
        PUSH  BC
        LD    B,0
DBYTE1: INC  B
        SUB  10
        JR   NC,DBYTE1
        ADD  A,10
        DEC  B
        LD   C,A
        LD   A,B
        JR   BYTE1

```

;** UP ZAHL **

```

; ZAHL (1 - 2 BYTE) IN DISPLAY
; UND SPEICHER VON KONSOLE EINGEBEN
; B -STELLENANZAHL (2,4)
; HL -ZAHLENENDE IM SPEICHER
; IX -RUECKSPRUNGADRESSE BEI CLEAR
; IY -ZAHLENANFANG IM DISPLAY
; DE -WIRD ZERSTOERT

```



```
ZAHL:  CALL  INA
      JR    Z,ZAHL
ZAHLA:  CALL  KOTEST
      JR    NC,ZAHL
      PUSH  AF
      RLD
      LD     A,3
      CP     B
      JR    NZ,ZA1
      DEC    HL
ZA1:    POP   AF
      CALL  ZIFF
      LD     D,A
      LD     A,80H
      AND    (IX)
      OR     D
      LD     (IX),A
      INC    IX
      DJNZ   ZAHL
      RET

ENTER:  CALL  INA
      JR    Z,ENTER
      CALL  KOTEST
      CP     17H
      JR    NZ,ENTER
      RET

INATES: CALL  INA
      JR    Z,INATES
KOTEST: CP     14H
      JR    NZ,KT1
      POP   DE
      JP    (IX)
KT1:    PUSH  IX
      LD     IX,RAM+RAMLEN
      CP     34H
      JR    NZ,KT2
      LD     SP,IX
      JP    MONITO
KT2:    CP     11H
      JR    NZ,KT3
      LD     SP,IX
      JP    HUELLP
KT3:    CP     12H
      JR    NZ,KT4
      LD     SP,IX
      JP    TREMP
KT4:    CP     13H
      JR    NZ,KT5
      LD     SP,IX
      JP    FILTP
KT5:    CP     30H
      JR    NZ,KT6
      LD     SP,IX
      JP    DRUMSE
KT6:    CP     31H
      JR    NZ,KT7
      LD     SP,IX
      JP    GENP
KT7:    CP     10H
      JR    NZ,KT8
```



```

LD      SP, IX
JP      FCOM
KT8:    POP      IX
RET

```

```

; ** UP INA **

```

```

; NZ - NEUES ZEICHEN IN A

```

```

INA:    EI
        PUSH     BC
        PUSH     DE
        PUSH     HL

```

```

;ENTPRELLUNG

```

```

LD      HL, INASTA
BIT     0, (HL)
RES     0, (HL)
JR      Z, INA01

```

```

LD      HL, 2000H
INA0:   DEC     HL
        LD      A, L
        OR      H
        JR      NZ, INA0

```

```

;ENTPRELLUNG

```

```

; 1. KONSOLABFRAGE

```

```

; (KONSOL) (BIT 0-2): SPALTE 1
; (KONSOL+1) (BIT 0-2): " 2
; (KONSOL+2) (BIT 0-2): " 3
; (KONSOL+3) (BIT 0-2): " 4

```

```

INA01:  LD      B, 4

```

```

; SPALTENANZAHL

```

```

LD      C, KONSOL
LD      D, 0

```

```

INA1:   IN      A, (C)

```

```

AND     7

```

```

; MASKE

```

```

CP      7

```

```

; TASTENDRUCK?

```

```

JR      NZ, INA2

```

```

LD      A, D

```

```

ADD     A, 6

```

```

; NAECHSTE SPALTE

```

```

LD      D, A

```

```

INC     C

```

```

; NAECHSTES PORT

```

```

DJNZ    INA1

```

```

LD      HL, INASTA

```

```

; KEIN TASTENDRUCK !

```

```

SET     1, (HL)

```

```

; SHIFT:=SHIFTE

```

```

BIT     2, (HL)

```

```

JR      NZ, INA4

```

```

RES     1, (HL)

```

```

JR      INA4

```

```

INA2:   DEC     A

```

```

ADD     A, D

```

```

LD      HL, INAT

```

```

ADD     A, L

```

```

LD      L, A

```

```

JR      NC, INA3

```

```

INC     H

```

```

INA3:   LD      A, (HL)

```

```

; KONSOLCODE

```

```

LD      HL, INASTA

```

```

BIT     1, (HL)

```

```

; SHIFT ?

```

```

JR      Z, INA31

```

```

RES     2, (HL)

```

```

; SHIFTE:=0

```



```

      ADD      A,20H
INA31: CP      15H          ; TASTE SHIFT ?
      JR      NZ,INA5
      SET     2,(HL)        ; SHIFTE:=1
      JR      INAS

```

; 2. TASTERABFRAGE

```

; TASTER 1..16 : AUS INA (A)
; DFH..D0H : (20H..2FH) - A0H..AFH
;
; TASTGR 1..8 : AUS INA (A)
; EFH..E8H : (10H..17H) - 90H..97H

```

```

INA4: IN      A,(TASTER)
      CP      0FFH
      JR      Z,INA5        ; TASTERDRUCK ?
      XOR     0FFH          ; NEGATION
      OR      80H           ; BIT7:=1
      PUSH   HL
      LD      HL,INAZ
      CP      (HL)
      POP    HL
      JR      Z,INA6

      CP      90H
      JR      C,INA41
      CP      98H
      JR      NC,INA41
      PUSH   AF
      AND     7
      LD      (TASTGR),A
      RLCA
      RLCA
      RLCA
      RLCA
      PUSH   HL
      LD      HL,DRUMS
      OR      (HL)
      POP    HL
      OUT    (PDRUMS),A
      JR      INA44

```

```

INA41: CP      0A0H
      JR      C,INA5
      CP      0B0H
      JR      NC,INA5
      PUSH   AF
      AND     0FH
      LD      C,A
      LD      HL,REGSP
      ADD    A,L
      LD      L,A
      JR      NC,INA42
      INC    H

```

```

INA42: LD      A,(TASTGR)
      LD      B,A
      INC    B
      XOR    A

```

```

INA43: RLA
      DJNZ   INA43
      XOR    (HL)

```

; TASTE RETTEN

; TASTE

; A:=0

; CY:=1

; MASKE BILDEN


```

LD      (HL),A
LD      B,A
LD      A,PREG      ;PORT BILDEN
ADD     A,C
LD      C,A
OUT     (C),B      ;AUSGABE
INA44:  POP      AF      ;TASTE HOLEN

INA5:   LD      HL,INAZ
CP      (HL)      ;ALTES ZEICHEN ?
LD      (HL),A
JR      Z,INA7

LD      HL,INASTA
SET     0,(HL)      ;ENTPRELLEN !!

INA6:   CP      0FFH      ;TASTENDRUCK ?
INA7:   POP      HL
POP     DE
POP     BC
RET

```


INAT: DEFB 10H
DEFB 0
DEFB 4
DEFB 8
DEFB 0CH
DEFB 14H
DEFB 11H
DEFB 1
DEFB 5
DEFB 9
DEFB 0DH
DEFB 15H

DEFB 12H
DEFB 2
DEFB 6
DEFB 0AH
DEFB 0EH
DEFB 16H

DEFB 13H
DEFB 3
DEFB 7
DEFB 0BH
DEFB 0FH
DEFB 17H

TXT1: DEFB 71H ; F
DEFB 39H ; C
DEFB 3FH ; 0
DEFB 37H ; M
DEFB 0
DEFW 0
TXT2: DEFB 37H ; M
DEFB 3FH ; 0
DEFW 0
DEFB 0
DEFB 76H ; H
DEFB 37H ; M
TXT3: DEFB 0DEH ; d.
DEFW 0
DEFW 8000H ; .
DEFW 0
TXT4: DEFB 86H ; I.
DEFW 0
DEFW 8000H ; .
DEFW 0
TXT5: DEFB 0BFH ; 0.
DEFW 0
DEFW 8000H ; .
DEFW 0
TXT6: DEFB 71H ; F
DEFB 0F7H ; A.
DEFW 0
DEFW 0
DEFB 80H
TXT7: DEFB 71H ; F
DEFB 0F9H ; E.
DEFW 0
DEFW 0
DEFB 80H


~~~~~

|        |      |      |     |
|--------|------|------|-----|
| TXT8:  | DEFB | 71H  | ;F  |
|        | DEFB | 0DEH | ;d. |
|        | DEFW | 0    |     |
|        | DEFW | 0    |     |
|        | DEFB | 80H  |     |
| TXT9:  | DEFB | 7CH  | ;b  |
|        | DEFB | 0F7H | ;A. |
|        | DEFW | 0    |     |
|        | DEFW | 0    |     |
|        | DEFW | 80H  |     |
| TXT10: | DEFB | 7CH  | ;b  |
|        | DEFB | 0F9H | ;E. |
|        | DEFW | 0    |     |
|        | DEFW | 0    |     |
|        | DEFB | 80H  |     |
| TXT11: | DEFB | 7CH  | ;b  |
|        | DEFB | 0DBH | ;Z. |
|        | DEFW | 0    |     |
|        | DEFW | 0    |     |
|        | DEFB | 80H  |     |
| TXT12: | DEFB | 76H  | ;H  |
|        | DEFB | 73H  | ;P  |
|        | DEFB | 0    |     |
|        | DEFB | 80H  | ;.  |
|        | DEFW | 0    |     |
| TXT13: | DEFB | 0    |     |
|        | DEFB | 31H  | ;T  |
|        | DEFB | 73H  | ;P  |
|        | DEFB | 0    |     |
|        | DEFB | 80H  | ;.  |
| TXT14: | DEFW | 0    |     |
|        | DEFB | 0    |     |
|        | DEFB | 71H  | ;F  |
|        | DEFB | 73H  | ;P  |
|        | DEFB | 0    |     |
| TXT15: | DEFB | 80H  | ;.  |
|        | DEFW | 0    |     |
|        | DEFB | 0    |     |
|        | DEFB | 50H  | ;r  |
|        | DEFB | 74H  | ;h  |
| TXT16: | DEFB | 0    |     |
|        | DEFB | 80H  | ;.  |
|        | DEFW | 0    |     |
|        | DEFB | 0    |     |
|        | DEFB | 3DH  | ;G  |
| TXT16: | DEFB | 73H  | ;P  |
|        | DEFB | 0    |     |
|        | DEFB | 80H  | ;.  |
|        | DEFW | 0    |     |
|        | DEFB | 0    |     |



\*\*\*\*\* ZYKLUS 01 \*\*\*\*\*

;\*\* ZYKLUSZEIT 1ms \*\*

;\*\* LAUFZEIT 33,6Mys \*\*

ZYKL01: EI

EXX

;REGISTER

EX

AF,AF'

;RETTEN

LD

A,(HL)

OUT

(PDISP),A

OUT

(C),D

;PDISP+1

RLC

D

INC

L

RES

3,L

EX

AF,AF'

EXX

RETI



\*\*\*\*\* ZYKLUS 02 \*\*\*\*\*

\*\* ZYKLUSZEIT 20ms \*\*

ZYKL02: EI

CALL RETREG  
CALL LOTAKT  
CALL MANPOL  
CALL SUSTAI  
CALL AMPLI  
CALL HOLREG  
RETI

\*\*\*\*\* UP LOTAKT \*\*\*\*\*

; LOESCHTABELLEN-AKTUALISIERUNG

LOTAKT: LD IX, LOELEN  
LD A, (IX)  
CP 1  
RET Z

; LOELEN=0

LD HL, LOETAB+1  
LD IY, LOETAB+1  
LD B, A  
DEC B

LTA01: LD A, (HL)  
LD C, A

DMA03: OUT (ASS), A

RLD  
AND 0FH  
SUB 3  
LD (IY), C  
INC HL  
INC IY  
LD C, A

DMA04: IN A, (ASS)

LTA02: DEC C

RRCA  
JR NZ, LTA02  
JR NC, LTA03  
DEC (IX)

; LOELEN-1

DEC IY

; ZEIGER-1

LTA03: DJNZ LTA01

RET



\*\*\*\*\* UP MANPOL \*\*\*\*\*

;MANUALPOLLING

;MATRIXZEILEN 1(C)-12(H)

;MATRIXSPALTEN 0(M1,00)-7(M2,03)

MANPOL: LD HL,NEWTAB

;NEWTAB

XOR A

;LOESCHEN

CALL TABLOE

LD C,ASS

LD B,0CH

LD E,A

LD IY,REGSP

MP01: OUT (C),B

;MATRIXSPALTE

DMA01: IN A,(C)

;MATRIXZEILE

CP 0FFH

;KEIN TASTENDRUCK ?

JP Z,MP10

LD D,40H

;M1.00

MP02: SCF

RRA

PUSH AF

;A RETTEN

JP C,MP09

;TASTE NICHT ?

LD A,D

;MAN&OKT

AND 0C0H

;MAN

OR E

LD E,A

;MANSTA

LD A,D

;MAN&OKT

OR B

;TON

PUSH BC

;BC RETTEN

LD HL,LOELEN

LD C,(HL)

LD B,0

INC HL

CPIR

JP Z,MP08

;LOESCH TASTE ?

LD BC,NOSZ

LD HL,OLDTAB

CPIR

JP Z,MP07

;ALTE TASTE ?

;NEUE TASTE !

LD (TON),A

LD HL,TONTAB

LD BC,NOSZ

CPIR

JR NZ,MP03

PUSH HL

;TASTE IM SUSTAIN

POP IX

LD (IX+PHATAB-TONTAB-1),1

LD (IX+AMPTAB-TONTAB-1),0

LD (IX+NEWTAB-TONTAB-1),A

LD (IX+INDTAB-TONTAB-1),0

CALL UDRUMS

LD BC,INDTAB-TONTAB-1



```

ADD      IX,BC
CALL     UATTAC
JP       MP06

MP03:    LD      HL,INDTAB
LD       B,NOSZ-1
PUSH     HL
LD       A,(HL)
MP04:    INC     HL
CP       (HL)
JR       NC,MP05
POP      IX
PUSH     HL
LD       A,(HL)
MP05:    DJNZ    MP04
POP      IX
LD       A,(IX+OLDTAB-INDTAB)
CP       0
JR       Z,MP051
LD       HL,LOELEN
INC      (HL)
LD       A,(HL)
ADD      A,L
LD       L,A
JR       NC,MP050
INC      H
MP050:   LD      A,(IX+OLDTAB-INDTAB)
LD       (HL),A
MP051:   LD      A,(TON)
LD       (IX+TONTAB-INDTAB),A
LD       (IX+NEWTAB-INDTAB),A
LD       (IX+PHATAB-INDTAB),1
LD       (IX+AMPTAB-INDTAB),0
LD       (IX),0
CALL     UATTAC
PUSH     BC
LD       C,(IX+MODTAB-INDTAB)
XOR      A
OUT      (C),A
LD       C,(IX+DECTAB-INDTAB)
OUT      (C),A
CALL     UDRUMS
JR       NC,MP058
LD       HL,TON
LD       A,(HL)
LD       C,(IX+CTCTAB-INDTAB)
AND      30H
BIT      7,(HL)
JR       Z,MP053
ADD      A,10H
MP053:   RRCA
LD       HL,OKICTC
ADD      A,L
LD       L,A
JR       NC,MP054
INC      H

```



```

MP054:  OUTI          ; CTC K.0
        OUTI          ; GRUNDTON
        INC          C
        OUTI          ; CTC K.1
        OUTI          ; QUINTE
        INC          C
        OUTI          ; CTC K.2
        OUTI          ; TERZ

        LD            A, (TON)
        RLCA
        RLCA
        AND          3
        LD            C, (IX+MODTAB-INDTAB)
        CP            3
        JR            NZ, MP055
        LD            A, 4
        JR            MP057
MP055:  CP            1
        JR            NZ, MP056
        BIT            1, (IY+14)
        JR            Z, MP057
        SET            1, A
        JR            MP057
MP056:  BIT            3, (IY+14)
        JR            Z, MP057
        SET            0, A

MP057:  OUT            (C), A
        LD            A, (TON)
        LD            C, (IX+DECTAB-INDTAB)
        OUT            (C), A

MP058:  POP            BC
MP06:   AND            0C0H
        RRCA
        RRCA
        OR             E
        LD            E, A
        JR            MP08

; ALTE TASTE !

MP07:   PUSH            HL
        POP            IX
        LD            (IX+NEWTAB-OLDTAB-1), A

MP08:   POP            BC
MP09:   LD            A, 10H
        ADD            A, D
        LD            D, A

        POP            AF
        CP            0FFH
        JP            NZ, MP02
MP10:   DEC            B
        JP            NZ, MP01

        LD            A, (MADRUM)
        OUT            (PDRUMS+1), A

```



```

XOR      B, A
LD       (MADRUM), A

LD       HL, MANSTA
LD       (HL), E
RLD
LD       (HL), E
DMA02:   OUT      (PRUEB), A
LD       A, E
AND      30H
RET      Z

LD       IX, INDTAB
LD       B, NOSZ
LD       A, 0FFH
MP11:    CP       (IX)
JR       Z, MP12
INC      (IX)
MP12:    INC      IX
DJNZ     MP11
RET

TABLOE:  LD       D, H
LD       E, L
LD       BC, OLDTAB-NEWTAB-1
INC      DE
LD       (HL), A
LDIR
RET

UDRUMS:  BIT      1, (IY+11)
JR       Z, UDR2
LD       A, (TON)
AND      70H
CP       70H
JR       NZ, UDR2
LD       A, (TON)
PUSH     HL
LD       HL, HDRUMT
AND      0FH
DEC      A
ADD      A, L
LD       L, A
JR       NC, UDR1
INC      H

UDR1:    LD       A, (MADRUM)
OR       (HL)
LD       (MADRUM), A
POP      HL
RET

UDR2:    SCF
RET

UATTAC:  LD       A, (TON)
AND      0C0H
CP       40H
JR       NZ, UATT2
BIT      1, (IY+12)
JR       Z, UATT1
SET      4, (IX+PHATAB-INDTAB)
UATT1:   BIT      1, (IY+13)
RET      Z

```



[illegible]



```

OKICTC: DEFB 47H (BATONI-BATAH9+XI), 2 SET
        DEFB 15 RET
        DEFB 47H ; JAHNMAN; HBB CP :STTAU
        DEFB 10 RET
        DEFB 47H ; TAEPEH DATA; (SI+YI), 2 BIT
        DEFB 12 ; UATZ 5, UATZ JR
        DEFW 0 (BATONI-BATAH9+XI), 4 SET
        DEFB 47H ; TAEPEH DATA; (SI+YI), 2 BIT :UATZ
        DEFB 30 (BATONI-BATAH9+XI), 2 RET
        DEFB 47H RET
        DEFB 20 RET
        DEFB 47H RET
        DEFB 24 RET
        DEFW 0 RET

        DEFB 47H
        DEFB 60
        DEFB 47H
        DEFB 40
        DEFB 47H
        DEFB 48
        DEFW 0

        DEFB 47H
        DEFB 120
        DEFB 47H
        DEFB 80
        DEFB 47H
        DEFB 96
        DEFW 0

        DEFB 47H
        DEFB 240
        DEFB 47H
        DEFB 160
        DEFB 47H
        DEFB 192
        DEFW 0

HDRUMT: DEFB 00010000B ; GROSSE TROMMEL
        DEFB 00001000B ; KLEINE TROMMEL
        DEFB 00000001B ; GROSSES BECKEN
        DEFB 00000010B ; KLEINES BECKEN
        DEFB 00000100B ; MARACAS
        DEFB 00100000B ; GROSSES BONGO
        DEFB 01000000B ; KLEINES BONGO
        DEFB 10000000B ; HOELZER
        DEFB 00100001B
        DEFB 01000001B
        DEFB 00100010B
        DEFB 01000010B

```



\*\*\*\*\* UP SUSTAI \*\*\*\*\*

; SUSTAINERMITTLUNG (PHASE 4)

```

SUSTAI: LD      B,NOSZ
        LD      C,0
        LD      IX,NEWTAB
        LD      HL,MANSTA
SUST1:  XOR     A
        CP      (IX)
        JR      NZ,SUST5
        CP      (IX+TONTAB-NEWTAB)
        JR      Z,SUST5

        LD      A,C
        OR      (IX+TONTAB-NEWTAB)
        LD      C,A
        XOR     A
        CP      (IX+OLDTAB-NEWTAB)
        JR      Z,SUST5

        LD      (IX+PHATAB-NEWTAB),4
        LD      A,(IX+OLDTAB-NEWTAB)
        AND     0C0H
        CP      40H
        JR      NZ,SUST2
        BIT     6,(HL)
        JR      NZ,SUST5
        LD      IY,STFIM1
        CALL    SUST10
        JR      SUST5
SUST2:  CP      80H
        JR      NZ,SUST5
        BIT     7,(HL)
        JR      NZ,SUST5
        LD      IY,STFIM2
        CALL    SUST10

SUST5:  INC     IX
        DJNZ    SUST1

        LD      A,(HL)
        RLCA
        RLCA
        AND     3
        OR      (HL)
        BIT     6,C
        JR      Z,SUST6
        SET     0,A
        SET     2,A
SUST6:  BIT     7,C
        JR      Z,SUST7
        SET     1,A
        SET     3,A
SUST7:  LD      (HL),A
        OUT     (MSTAT),A

        LD      HL,NEWTAB
        LD      DE,OLDTAB
        LD      BC,NOSZ
        LDIR
        RET

```

; SUSTAIN !

; SUSTAIN-ANFANG !

; MAN1 ?

; WEITERER TON IN MAN1?

; MAN2 ?

; WEITERER TON IN MAN2?

; MANSTA

; MANSTA

; UMLADEN



```
SUST10: SET      0, (IY+0)          ; UMSCHALTEN AUF PHASE 3
          SET      1, (IY+0)          ; IN FTGAMP
          SET      0, (IY+STTRM1-STFIM1)
          SET      1, (IY+STTRM1-STFIM1)
          AND      0C0H
          RET      NZ
          LD       IY, STGEN
          SET      0, (IY)
          SET      1, (IY)
          RET
```



\*\*\*\*\* UP AMPLI \*\*\*\*\*

; AMPLITUDENERMITTLUNG

```

AMPLI:  LD      IX,PHATAB
        LD      B,NOSZ

AMPL01: LD      A,(IX)          ; PHASE HOLEN
        AND     7              ; BIT 3-7 AUSBLENDEN

PHASE1: CP      1
        JP      C,AMPL06
        JR      NZ,PHASE2
        LD      A,(IX+AMPTAB-PHATAB)
        CALL    SETIY
        ADD     A,(IY+0)        ; HPn1
        LD      C,A
        LD      A,(IY+1)        ; HPn2
        JR      NC,PHAS11
        INC     (IX)            ; UMSCHALTEN AUF PHASE 2
        AND     A              ; HPn2=0 ?
        LD      A,0FFH
        JP      NZ,AMPL05
        JR      PHAS21          ; UMSCHALTEN ZU PHASE 3

PHAS11: AND     A
        LD      A,C
        JR      NZ,AMPL05
        CP      (IY+2)          ; HPn3
        JR      C,AMPL05
        INC     (IX)            ; UMSCHALTEN AUF PHASE 2
        JR      PHAS21          ; UMSCHALTEN ZU PHASE 3

PHASE2: CP      2
        JR      NZ,PHASE4
        LD      A,(IX+AMPTAB-PHATAB)
        CALL    SETIY
        SUB     (IY+1)          ; HPn2
        JR      C,PHAS21
        CP      (IY+2)          ; HPn3
        JR      NC,AMPL05

PHAS21: BIT     4,(IX)          ; ATTAC REPEAT ?
        JR      NZ,PHAS22
        BIT     3,(IX)          ; ATTAC DOUBLE ?
        JR      Z,PHAS23
        RES     3,(IX)          ; RES ATTAC DOUBLE
PHAS22: DEC     (IX)            ; UMSCHALTEN AUF PHASE 1
        LD      A,1             ; AMPLITUDE
        JR      AMPL05
PHAS23: INC     (IX)            ; UMSCHALTEN AUF PHASE 3
        LD      A,(IY+2)        ; HPn3
        JR      AMPL05

PHASE4: CP      4
        JR      NZ,AMPL06
        LD      A,(IX+AMPTAB-PHATAB)
        CALL    SETIY
        SUB     (IY+3)          ; HPn4
        JR      C,PHAS41
        JR      NZ,AMPL05
PHAS41: LD      (IX),0          ; TON LOESCHEN
        LD      (IX+TONTAB-PHATAB),0

```



```

LD      (IX+INDTAB-PHATAB),0FFH
XOR     A
PUSH    BC
LD      C,(IX+DECTAB-PHATAB)
OUT     (C),A
POP     BC
LD      A,1
AMPL05: LD      (IX+AMPTAB-PHATAB),A
LD      C,(IX+ANATAB-PHATAB)
LD      D,45H
AMPL51: OUT     (C),D
OUT     (C),A
AMPL06: INC     IX
DEC     B
JP      NZ,AMPL01

```

```

; AMPLITUDENAUSGABE FUER FILTER-, TREMOLO- UND
; GENERATORENSTEuerung

```

```

LD      A,(MANSTA)          ; MANUALSTATUS
BIT     4,A                 ; NEUANSCHLAG MAN1 ?
JR      Z,AMPL72
LD      IY,STFIM1
LD      (IY+0),4            ; BIT2:=1
LD      (IY+STTRM1-STFIM1),4
LD      (IY+STGEN-STFIM1),4
LD      A,(REGSP+8)
BIT     1,A                 ; FILTER UP MAN1 ?
JR      Z,AMPL70
SET     5,(IY+0)
AMPL70: LD      A,(REGSP+9)
BIT     1,A                 ; TREMOLO UP MAN1 ?
JR      Z,AMPL71
SET     5,(IY+STTRM1-STFIM1)
AMPL71: JR      AMPL74

AMPL72: BIT     5,A          ; NEUANSCHLAG MAN2 ?
JR      Z,AMPL80
LD      IY,STFIM2
LD      (IY+0),4            ; BIT2:=1
LD      (IY+STTRM2-STFIM2),4
LD      (IY+STGEN-STFIM2),4
LD      A,(REGSP+8)
BIT     3,A                 ; FILTER UP MAN2 ?
JR      Z,AMPL73
SET     5,(IY+0)
AMPL73: LD      A,(REGSP+9)
BIT     3,A                 ; TREMOLO UP MAN2 ?
JR      Z,AMPL74
SET     5,(IY+STTRM2-STFIM2)
AMPL74: LD      A,(REGSP+15)
BIT     6,A                 ; GENERATOREN UP ?
JR      Z,AMPL80
LD      IY,STGEN
SET     3,(IY+6)

```

```

; AUSGABE AUF PORT AFTG

```

```

AMPL80: LD      C,AFTG
LD      B,5

```



```

      LD      IY,FP11
      LD      IX,AFIM1
AMPL81: CALL  FTGAMP
      LD      A,(IX)
      OUT     (C),A
      INC     C
      INC     IX
      LD      DE,NFPM
      ADD     IY,DE
      DJNZ    AMPL81

;   AUSGABE DER AMPLITUDEN (RESERVE)
      LD      C,AFTG+7
      LD      B,B
      LD      HL,AMPTAB
AMPL82: INC   C
      OUTI
      JR      NZ,AMPL82
      RET

```

```

;***  UP SETIY  ***

```

```

SETIY: LD      IY,HP11
      BIT     6,(IX+TONTAB-PHATAB)
      RET     NZ
      LD      DE,4
      ADD     IY,DE
      RET

```

```

;MANUAL 1

```

```

;***  UP FTGAMP  ***

```

```

;IY AUF PARAMETERTABELLE GERICHTET
;IX AUF AMPLITUDENSPEICHER GERICHTET

```

```

FTGAMP: LD      A,(IX+STFIM1-AFIM1)    ;STATUSWORT
      AND     7                        ;LEER ?
      RET     Z

      BIT     2,A                      ;NEUANSCHLAG ?
      JR      Z,FTG1
      RES     2,(IX+STFIM1-AFIM1)
      SET     0,(IX+STFIM1-AFIM1)    ;PHASE:=1
      LD      A,(IY)                  ;P1
      CP      (IY+2)                  ;P1>P3 ?
      JR      NC,FTG4
      SET     4,(IX+STFIM1-AFIM1)    ;PHASE1 UP !
      JR      FTG4

FTG1:  CP      1                      ;PHASE1 ?
      JR      NZ,FTG3
      LD      A,(IX)                  ;AMPLITUDE
      BIT     4,(IX+STFIM1-AFIM1)    ;PHASE1 UP ?
      JR      Z,FTG11
      ADD     A,(IY+1)                ;P2
      JR      C,FTG12
      CP      (IY+2)                  ;P3
      JR      C,FTG4
      JR      FTG12

FTG11: SUB     (IY+1)                ;PHASE1 DOWN
      JR      C,FTG12
      CP      (IY+2)                  ;P3

```



```
~~~~~
JR NC,FTG4
FTG12: INC (IX+STFIM1-AFIM1) ;UMSCH. AUF PHASE2
LD A,(IX+2) ;P3
JR FTG4

FTG3: CP 3 ;PHASE3 ?
RET NZ
LD A,(IX) ;AMPLITUDE
BIT 5,(IX+STFIM1-AFIM1) ;PHASE3 UP ?
JR NZ,FTG31
ADD A,(IX+3) ;P4
JR NC,FTG4 ;RESERVE
LD A,0FFH
JR FTG32
FTG31: SUB (IX+3) ;P4
JR NC,FTG4
LD A,0
FTG32: RES 0,(IX+STFIM1-AFIM1)
RES 1,(IX+STFIM1-AFIM1)

FTG4: LD (IX),A ;AMPLITUDE
RET
```



\*\*\*\*\* UP RETREG \*\*\*\*\*

;RETEN REGISTER

RETREG: EX        (SP),HL  
         PUSH     AF  
         PUSH     BC  
         PUSH     DE  
         PUSH     IX  
         PUSH     IY  
         JP        (HL)

\*\*\*\*\* UP HOLREG \*\*\*\*\*

;HOLEN REGISTER

HOLREG: POP       HL                                ; ADRESSE  
         POP       IY  
         POP       IX  
         POP       DE  
         POP       BC  
         POP       AF  
         EX        (SP),HL  
         RET



| LOC  | OBJ CODE M | STMT | SOURCE STATEMENT                               |
|------|------------|------|------------------------------------------------|
| 1000 |            | 1998 | ORG RAM                                        |
|      |            | 1999 |                                                |
|      |            | 2000 | ;***** RAMDEFINITIONEN *****                   |
|      |            | 2001 |                                                |
| 1000 |            | 2002 | DPUFF: DEFS 8 ;DISPLAYPUFFER                   |
|      |            | 2003 |                                                |
| 1008 |            | 2004 | TONTAB: DEFS 8                                 |
|      |            | 2005 | ; Wertebereich: Toncode                        |
|      |            | 2006 | ; -Klingende Toene = Laufende T. + Sustain T.  |
|      |            | 2007 |                                                |
| 1010 |            | 2008 | NEWTAB: DEFS 8                                 |
|      |            | 2009 | ; Wertebereich: Toncode                        |
|      |            | 2010 | ; -Laufende Toene im aktuellen Zyklus Z        |
|      |            | 2011 |                                                |
| 1018 |            | 2012 | OLDTAB: DEFS 8                                 |
|      |            | 2013 | ; Wertebereich: Toncode                        |
|      |            | 2014 | ; -Alte laufende Toene des letzten Zyklus' Z-1 |
|      |            | 2015 |                                                |
| 1020 |            | 2016 | INDTAB: DEFS 8                                 |
|      |            | 2017 | ; Wertebereich: 00 (neu angeschlagen)          |
|      |            | 2018 | ; -0FFH (Maximales Alter oder leer)            |
|      |            | 2019 |                                                |
| 1028 |            | 2020 | AMPTAB: DEFS 8                                 |
|      |            | 2021 | ; Wertebereich: 01 (kleinste)                  |
|      |            | 2022 | ; -FFH (groesste Tonamplitude)                 |
|      |            | 2023 |                                                |
| 1030 |            | 2024 | PHATAB: DEFS 8                                 |
|      |            | 2025 | ; BIT 0..2: 0 => leer                          |
|      |            | 2026 | ; 1-4 => Phase 1-4                             |
|      |            | 2027 | ; der Amplitudenhuellkurve                     |
|      |            | 2028 | ; BIT 3 : Merker 1. Anschlag Double Attac      |
|      |            | 2029 | ; BIT 4 : Merker Repeat Attac                  |
|      |            | 2030 |                                                |
| 1038 |            | 2031 | DECTAB: DEFS 8                                 |
|      |            | 2032 | ; Tondekodierport-Tabelle (Bei Initialisierung |
|      |            | 2033 | ; erstellt)                                    |
|      |            | 2034 |                                                |
| 1040 |            | 2035 | CTCTAB: DEFS 8                                 |
|      |            | 2036 | ; Otavdekodierport-Tabelle ( -"- )             |
|      |            | 2037 |                                                |
| 1048 |            | 2038 | ANATAB: DEFS 8                                 |
|      |            | 2039 | ; Amplitudenport-Tabelle ( -"- )               |
|      |            | 2040 |                                                |
| 1050 |            | 2041 | MODTAB: DEFS 8                                 |
|      |            | 2042 | ; Modulationsdekodierport-Tabelle ( -"- )      |
|      |            | 2043 |                                                |
| 1058 |            | 2044 | AFIM1: DEFS 1 ;AMP FILTER MAN1                 |
| 1059 |            | 2045 | AFIM2: DEFS 1 ;AMP FILTER MAN2                 |
| 105A |            | 2046 | ATRM1: DEFS 1 ;AMP TREMOLO MAN1                |
| 105B |            | 2047 | ATRM2: DEFS 1 ;AMP TREMOLO MAN2                |
| 105C |            | 2048 | AGEN: DEFS 1 ;AMP GENERATOREN                  |



```

105D 2050 STFIN1: DEFS 1 ;STAT FILTER MAN1
 2051 ; BIT 0..1: 0 => leer
 2052 ; BIT 1-3 => Phase 1-3
 2053 ; der Filterhuelikurve
 2054 ; BIT 2 : Neuanschlag
 2055 ; BIT 4 : Phase 1 Up
 2056 ; BIT 5 : Phase 3 Up
105E 2057 STFIN2: DEFS 1 ;STAT FILTER MAN2
105F 2058 STTRM1: DEFS 1 ;STAT TREMOLO MAN1
1060 2059 STTRM2: DEFS 1 ;STAT TREMOLO MAN2
1061 2060 STGEN: DEFS 1 ;STAT GENERATOREN
 2061
1062 2062 MANSTA: DEFS 1 ;MANUALSTATUS
 2063 ; BIT 0: Tastendruck oder Sustain Man1
 2064 ; BIT 1: -- -- -- -- Man2
 2065 ; BIT 2: Sustain Man1
 2066 ; BIT 3: -- -- -- -- Man2
 2067 ; BIT 4: Neuanschlag Man1
 2068 ; BIT 5: -- -- -- -- Man2
 2069 ; BIT 6: Tastendruck Man1
 2070 ; BIT 7: -- -- -- -- Man2
 2071 ;
 2072
1063 2073 TON: DEFS 1
 2074 ;Toncode:
 2075 ;BIT: 7 6 5 4 3 2 1 0
 2076 ;
 2077 ; 0 0 0 1 c
 2078 ; 0 0 1 0 cis
 2079 ; 0 0 1 1 d
 2080 ; 0 1 0 0 dis
 2081 ; 0 1 0 1 e
 2082 ; 0 1 1 0 f
 2083 ; 0 1 1 1 fis
 2084 ; 1 0 0 0 g
 2085 ; 1 0 0 1 gis
 2086 ; 1 0 1 0 a
 2087 ; 1 0 1 1 b
 2088 ; 1 1 0 0 h
 2089 ;
 2090 ; 0 0 0 Oktave 0 von oben
 2091 ; 0 1 1 -- 1
 2092 ; 1 1 0 -- 2
 2093 ; 1 1 1 -- 3
 2094 ;
 2095 ; 0 1 1 Manual 1
 2096 ; 1 1 0 -- 2
 2097 ; 1 1 1 Pedal
 2098 ;
 2099
1064 2100 MADRUM: DEFS 1 ;MANUAL DRUM
 2101
1065 2102 LOELEN: DEFS 1
1066 2103 LOETAB: DEFS 50

```



| LOC  | OBJ CODE | M | STMT | SOURCE                       | STATEMENT                   |
|------|----------|---|------|------------------------------|-----------------------------|
| 1098 |          |   | 2105 | INASTA: DEFS                 | 1 ; INA STATUS              |
|      |          |   | 2106 |                              | ; BIT0-ENTPRELLUNG          |
|      |          |   | 2107 |                              | ; BIT1-SHIFT                |
|      |          |   | 2108 |                              | ; BIT2-SHIFTE               |
|      |          |   | 2109 |                              |                             |
| 1099 |          |   | 2110 | INAZ: DEFS                   | 1 ; AKT. TASTER             |
| 109A |          |   | 2111 | MADR1: DEFS                  | 2 ; MON. ADRESSE            |
| 109C |          |   | 2112 | MADR2: DEFS                  | 2                           |
| 109E |          |   | 2113 | MADR3: DEFS                  | 2                           |
| 10A0 |          |   | 2114 | MDAT: DEFS                   | 1 ; MON. DATEN              |
|      |          |   | 2115 |                              |                             |
| 10A1 |          |   | 2116 | TASTGR: DEFS                 | 1 ; TASTERGRUPPE            |
|      |          |   | 2117 |                              |                             |
| 10A2 |          |   | 2118 | PAREAD: DEFS                 | 2 ; PARAMETEREINGABEADRESSE |
| 10A4 |          |   | 2119 | PARECO: DEFS                 | 1 ; PARAMETEREINGABECODE    |
|      |          |   | 2120 |                              |                             |
| 10A5 |          |   | 2121 | FKOMB: DEFS                  | 1 ; FREIE KOMB.             |
|      |          |   | 2122 |                              |                             |
|      |          |   | 2123 | ; AKTUELLE FREIE KOMBINATION |                             |
|      |          |   | 2124 |                              |                             |
| 10A6 |          |   | 2125 | REGSP: DEFS                  | 16 ; REGISTERSPEICHER       |
| 10B6 |          |   | 2126 | DRUMS: DEFS                  | 1 ; RHYTHMUS                |
| 10B7 |          |   | 2127 | HP11: DEFS                   | NHP ; HUELLEKURVENPARAMETER |
| 10BF |          |   | 2128 | FP11: DEFS                   | NFP ; FILTERPARAMETER       |
| 10C7 |          |   | 2129 | TP11: DEFS                   | NTP ; TREMOLOPARAMETER      |
| 10CF |          |   | 2130 | GP1: DEFS                    | NGP ; GENERATORPARAMETER    |
|      |          |   | 2131 |                              |                             |
|      |          |   | 2132 | ; FREIE KOMBINATIONEN        |                             |
|      |          |   | 2133 |                              |                             |
| 10D3 |          |   | 2134 | FK0: DEFS                    | FKLEN*16                    |
|      |          |   | 2135 |                              |                             |
| 13A3 |          |   | 2136 | ENDE: DEFS                   | 1                           |



EXTRACT OTOR

RECORD COUNT=0018 RECORD LENGTH=0080 BYTES IN LAST RECORD=0080

ENTRY=0000 LOW ADDRESS=0000 HIGH ADDRESS=13A3 STACK SIZE=0080

SEGMENTS:

0000 0D18

%



```

597
598 ; *****
599 ;
600 ; DIAGNOSEPROGRAMM FUER OTOR
601 ; ZYKLUS 01
602 ;
603 ; *****
604
605 ; AENDERUNGEN IN OTOR.S
606 ; -----
607 ; TONDEC: EQU 40H
608 ; AMPOUT: EQU 40H
609 ; RAM: EQU 9000H
610 ; WARTE: RET
611 ; MP01: CALL DIAG1
612 ; DMA01: NOP
613 ; DMA02: LD (DBYT01),A
614 ; DMA03: LD (DTAB01),A
615 ; DMA04: CALL DIAG2
616 ; -----
617
8372 E5 618 DIAG1: PUSH HL
8373 2100A0 619 LD HL,DTAB01
8376 70 620 LD (HL),B
8377 78 621 LD A,B
8378 E60F 622 DIA11: AND 0FH
837A 85 623 ADD A,L
837B 6F 624 LD L,A
837C 3001 625 JR NC,DIA12
837E 24 626 INC H
837F 7E 627 DIA12: LD A,(HL)
8380 E1 628 POP HL
8381 C9 629 RET
8382 E5 630 DIAG2: PUSH HL
8383 2100A0 631 LD HL,DTAB01
8386 7E 632 LD A,(HL)
8387 18EF 633 JR DIA11
634
A000 635 ORG RAM+1000H
A000 636 DTAB01: DEFS 13
A00D 637 DBYT01: DEFS 1

```



%

|     |          |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
|-----|----------|--------|----|----|----|----|----|----|----|-------|--------|---|---|-----|---|---|---|--|--|
|     |          |        |    |    |    |    |    |    |    | ***** |        |   |   |     |   |   |   |  |  |
| 01H | MANMAT   | TONTAB | 59 | 66 | 57 | 48 | 00 | 00 | 00 | 00    | PRUEB  | 1 | 1 | 0   | 0 | ! | * |  |  |
|     |          |        |    |    |    |    |    |    |    | ***** |        |   |   |     |   |   |   |  |  |
|     |          | NEWTAB | 59 | 66 | 57 | 48 | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| OUT | IN       | OLDTAB | 59 | 66 | 57 | 48 | 00 | 00 | 00 | 00    | TON    |   |   | 59H | ! | * |   |  |  |
|     |          |        |    |    |    |    |    |    |    | ***** |        |   |   |     |   |   |   |  |  |
| 1   | 01111111 | AMPTAB | 3D | 54 | 4D | 44 | 00 | 00 | 00 | 00    | MANSTA |   |   | 0FH | ! |   |   |  |  |
| 2   | 10111111 | PHATAB | 01 | 01 | 01 | 01 | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 3   | 11011111 | DECTAB | 40 | 41 | 42 | 43 | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 4   | 11101111 | CTCTAB | 40 | 44 | 48 | 4C | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 5   | 11110111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 6   | 11111011 | LOELEN | 06 |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 7   | 11111101 | LOETAB | 00 | B1 | A2 | 93 | 84 | 75 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 8   | 11111110 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 9   | 11111101 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 10  | 11111111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 11  | 11111111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 12  | 11111111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |

START (Y/N/Q/P): P

|     |          |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
|-----|----------|--------|----|----|----|----|----|----|----|-------|--------|---|---|-----|---|---|---|--|--|
|     |          |        |    |    |    |    |    |    |    | ***** |        |   |   |     |   |   |   |  |  |
| 01H | MANMAT   | TONTAB | 59 | 6A | 57 | 48 | 00 | 00 | 00 | 00    | PRUEB  | 1 | 1 | 0   | 1 | ! | * |  |  |
|     |          |        |    |    |    |    |    |    |    | ***** |        |   |   |     |   |   |   |  |  |
|     |          | NEWTAB | 59 | 6A | 57 | 48 | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| OUT | IN       | OLDTAB | 59 | 6A | 57 | 48 | 00 | 00 | 00 | 00    | TON    |   |   | 6AH | ! | * |   |  |  |
|     |          |        |    |    |    |    |    |    |    | ***** |        |   |   |     |   |   |   |  |  |
|     |          | INDTAB | 02 | 01 | 04 | 03 | FF | FF | FF | FF    |        |   |   |     |   |   |   |  |  |
| 1   | 01111111 | AMPTAB | 3F | 01 | 4F | 46 | 00 | 00 | 00 | 00    | MANSTA |   |   | 0FH | ! |   |   |  |  |
| 2   | 10111111 | PHATAB | 01 | 01 | 01 | 01 | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 3   | 11011111 | DECTAB | 40 | 41 | 42 | 43 | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 4   | 11101111 | CTCTAB | 40 | 44 | 48 | 4C | 00 | 00 | 00 | 00    |        |   |   |     |   |   |   |  |  |
| 5   | 11110111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 6   | 11111011 | LOELEN | 07 |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 7   | 11111101 | LOETAB | 00 | B1 | A2 | 93 | 84 | 75 | 66 | 00    |        |   |   |     |   |   |   |  |  |
| 8   | 11111110 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 9   | 11111101 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 10  | 11111011 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 11  | 11111111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |
| 12  | 11111111 |        |    |    |    |    |    |    |    |       |        |   |   |     |   |   |   |  |  |

START (Y/N/Q/P): P